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Hiatal hernia with upside-down stomach. Management of acute incarceration: case presentation and review of literature

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Abstract: Upside-down stomach (UDS) represents the rarest type of hiatal hernia (<5%) and is characterized by herniation of the entire stomach or most gastric portions into the posterior mediastinum. We present here a very rare complication of such a condition which is incarceration of upside-down stomach. A 54 year-old female was admitted to the emergency department presenting signs of acute epigastric pain radiating into thorax. Computed tomography revealed a giant hiatal hernia with incarceration of the gastric trunk. Immediate operation for reduction of the incarcerated stomach and repair of the hiatal defect was performed. The patient was discharged without any complication and was followed up at the surgical outpatient department. The presented case confirms that differentiation of an acute epigastric or intrathoracic pain in adults should always exclude presence of hiatal hernia which in case of incarceration should be treated by prompt surgical management.

Key words: Hiatal hernia, upside-down stomach, incarceration, fundoplasty, Nissen procedure.

Introduction

Upside-down stomach (UDS) is characterized by herniation of the entire stomach or most gastric portions into the posterior mediastinum. Symptoms may vary heavily as they are related to reflux and mechanically impaired gastric emptying. UDS is associated with a risk of incarceration and volvulus development which both might be complicated by acute gastric outlet obstruction, advanced ischemia, gastric bleeding and perforation.

Case presentation

A 54 year-old female was admitted to emergency department with signs of acute epigastric pain radiating into thorax that lasted several hours. The pain started immediately after meal intake and has been associated with nausea and vomiting. The patient reported on having had earlier recurrent substernal pain, dysphagia and symptoms of reflux for many years. Furthermore the patient had history of hypertension that was treated irregularly. She reported that a day before she was admitted to other emergency department, where she was treated symptomatically and discharged after some improvement and pain relief. When the pain worsened again she referred to our institution. Clinical examination revealed slightly distended abdomen with only some epigastric tenderness with no guarding or rebound phenomena. Bowel sounds were present and normal. No abdominal masses were palpable, and no signs of peritoneal irritation were detected. Thorax auscultation revealed no evident pathology.

On further examination she was not feverish. Her pulse was 85 beats/min and blood pressure was 134/89 mmHg. Peripheral oxygen saturation was 98% and respiratory rate was 13 breaths/min. Cardiovascular and respiratory examinations were unremarkable.

Hematological investigations revealed hemoglobin concentration of 12.8 g/dl, white blood cell count 11 000 per microliter and normal coagulation profile. Blood biochemistry was normal. D-dimers level was 0.26 mg/ml and amylase level — 36 units/l. Cardiac enzymes were normal.

Blood lactate and glucose concentrations were within normal limits. A 12 lead electrocardiography (ECG) showed normal sinus rhythm with a rate of 80 beats/min and no acute ischaemic changes. An abdominal radiograph was unremarkable. Upright chest radiography showed gastric gas in the posterior mediastinum (Fig. 2, 3). Computed tomography revealed a giant hiatal hernia. Most portions of the stomach with the greater omentum had migrated into the posterior mediastinum causing incarceration of the gastric trunk. We did not attempt to perform gastroscopy or to introduce nasal tube preoperatively because of perforation risk.

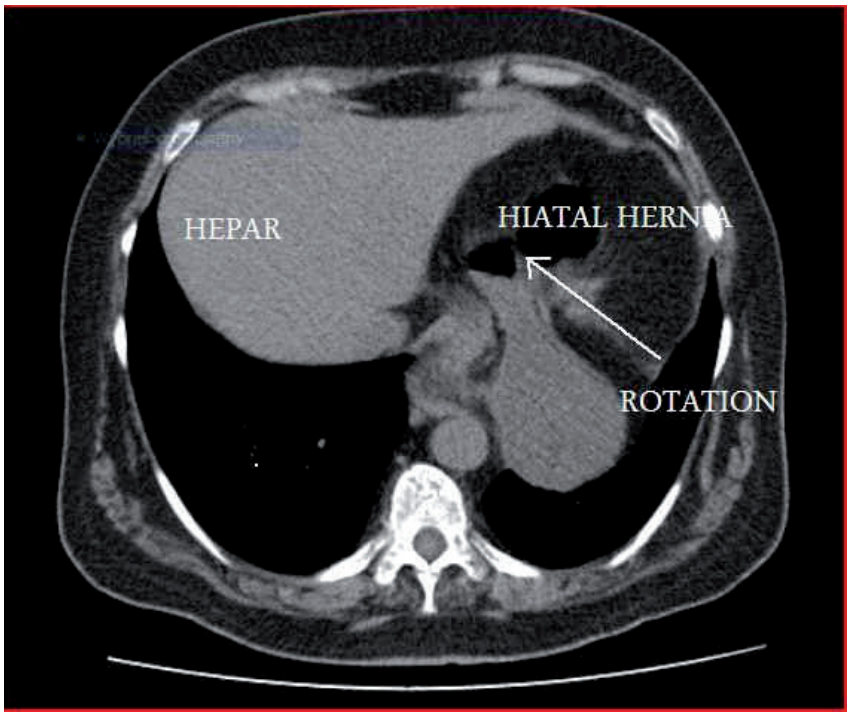

Fig. 1. Computed tomography scan of the upside-down stomach.

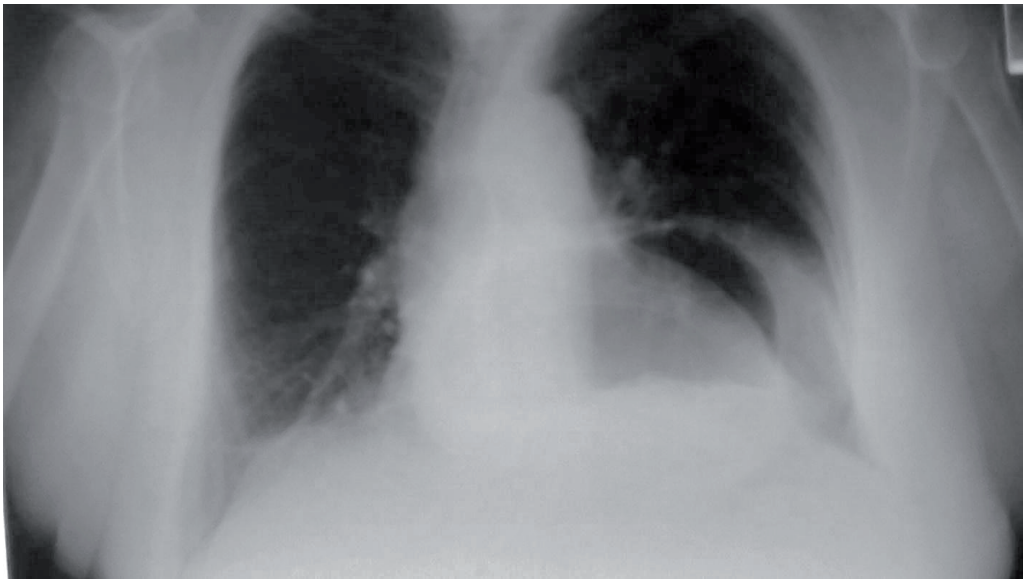

Fig. 2. PA chest radiograph of the upside-down stomach.

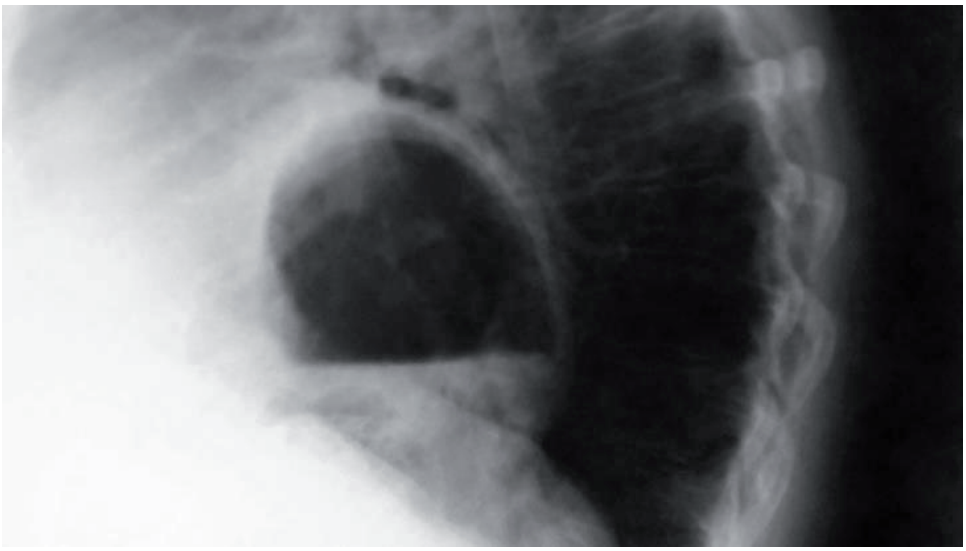

Fig. 3. Chest radiograph of the upside-down stomach — lateral view.

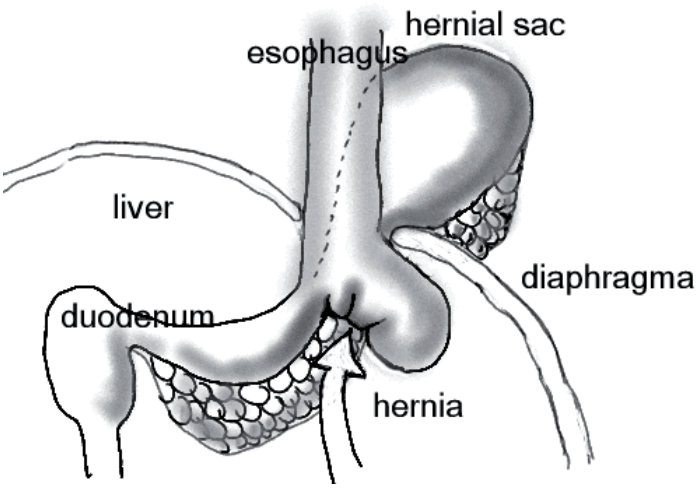

Fig. 4. Scheme of hiatal hernia incarceration with upside-down stomach.

Emergent operation for reduction of the incarcerated stomach and repair of the hiatal defect was performed. The upper median laparotomy approach was used to expose the peritoneal cavity. After stomach withdrawal from the thorax cavity, it recovered the normal color and blood supply. Hiatoplasty was performed by anterior approximation of the diaphragmatic crura, and suturing them using 3.0 dissolvable stitches. Later the 180 degree floppy Nissen fundoplication was accomplished.

Liberation of greater curvature was hampered by multiple adhesions and greasy omentum. Unforunately by that maneuver the spleen was injured and splenectomy was necessary. The patient after operation was admitted to the intensive care unit for postoperative observation and on the next day was referred to the surgical ward after chest radiograph which was unremarkable. The patient was discharged one week later without any complication and was followed up at the surgical outpatient department.

Discussion

Hiatal hernias are classified into 4 types. In type I — a sliding hiatal hernia, the gastroesophageal junction (GEJ) migrates cephalad through the hiatus into the thorax. In type II — paraesophageal hernia, the gastric fundus herniates through the hiatus into the thorax, but the GEJ remains in the abdomen. In type III, which is a combination of types I and II, the GEJ and stomach herniate into the thorax. Type IV is a type III hiatal hernia with herniation of other organs into the thorax, such as colon and spleen. Among these types of hernias, sliding hiatal hernia is the most common, accounting for 90%–95% of cases. Paraesophageal hernia is the second most common and accounts for 5% of cases [1–7].

The etiology of esophageal hiatal hernia include congenital opening end deformity of the esophageal hiatus, acquired vulnerability of connective tissue because of obesity or aging, or increased abdominal pressure [8–11]. The presented case displayed the rare complication of paraoesophageal hernia which presents most often in adults. Esophageal hernia is treated initially usually in a conservative way, however, in some situations surgery is highly recommended. One of those situations, as here presented, may occur in the case of hiatal hernia with upside-down stomach which is the rarest type of hiatal paraesophageal hernia (<5%). That surgical intervention may protect the patient from complications such as gastrointestinal necrosis due to strangulation, gastric perforation, or massive hemorrhage. Nevertheless such complication is extremely uncommon as it should be maintained with unlimited care mainly because of high mortality rate.

Two approaches are commonly used for the repair of esophageal hernias: the transthoracic approach and the transabdominal approach. The Allison, Belsey (Mark IV) techniques [12] are transthoracic approaches. The techniques of Hill [13], Nissen, and Toupet [14] are transabdominal approaches. In this case, the transabdominal technique of Nissen was used. We believe, and that is also confirmed in literature that the choice of the approach should depend on surgeon preference and experience. The main subject is to decide to perforn immediate operation which would protect the patient from possible upper gastrointestinal perforation.

The presented case confirms that differentiation of an acute epigastric or intrathoratic pain in adults should always exclude hiatal hernia presence. In particular,

paraesophageal hernia with incarceration of stomach or other gastrointestinal organ which may be associated with a higher risk of upper gastrointestinal perforation should be expected, and therefore, in these cases surgical treatment should be always taken into consideration as well [15, 16].

This case also highlights the importance of maintaining a high index of suspicion in the case of non-cardiac, life threatening causes of chest pain. Based on that experience we would recommend early surgery in patients with upside-down stomach what in our case permitted to cure the patient and protect from complications.

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